## Space Weather Forecast

Issued on Wednesday, 14 September 2022 at 13:28 Local

**This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales**

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**Space Weather Forecast Headline: Chance of G1/Minor Storms days 1 to 4 (14th to 17th). Moderate class flares considered likely.**

**Analysis of Space Weather Activity over past 24 hours**

**Solar Activity:** Solar activity has been Moderate with an M-class flare at 14/1018 UTC. There are four sunspot regions on the disk. AR3098 in the northwest quadrant remains the largest and most complex spot. AR3100, is elongated but only has one significant spot. The remaining significant region, AR3102 has rotated onto the southeast limb with a large leader and small trailing spot. The remaining unnumbered region is small and simple. There is some evidence that the CME which left the Sun on the 11th may have glanced Earth this morning, though geomagnetic response remains muted.
No new Earth-directed coronal mass ejections were evident in imagery.

**Solar Wind / Geomagnetic Activity:** Despite the CME arrival the solar wind speed remained at background levels. The total magnetic field strength was weak increasing to moderate following the CME, though the north-south component remained weak. Geomagnetic activity was Quiet.

**Energetic Particles / Solar Radiation:** The high energy proton flux was slightly elevated but well below S1 levels.

**Four-Day Space Weather Forecast Summary**

**Solar Activity:** Moderate levels of solar activity are considered likely with a slight chance of reaching Strong levels.

**Solar Wind / Geomagnetic Activity:** The coronal mass ejection which was observed leaving the Sun on 11 September arrived at Earth this morning, thus far geomagnetic response has been muted. A coronal hole fast wind may arrive from midday day 3 (16th), perhaps bringing elevated solar wind speeds until the end of the period. Geomagnetic activity is forecast to be mainly Quiet to Unsettled through the period, with Active intervals likely at times and a chance of G1/Minor Storms.

**Energetic Particles / Solar Radiation:** No solar radiation storms are expected.

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Met Office

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**Geomagnetic Storms:**

| Geo-Magnetic Storm Probability (Exceedance) | Level | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Minor or Moderate | G1 to G2 | No | 25 | 25 | 25 | 25 |
| Strong | G3 | No | 1 | 1 | 1 | 1 |
| Severe | G4 | No | 1 | 1 | 1 | 1 |
| Extreme | G5 | No | 1 | 1 | 1 | 1 |

**Radio Blackouts - X Ray Flares:**

| X Ray Flares Probability | Level | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Active | R1-R2 M Class | No | 60 | 60 | 60 | 60 |
| Very Active | R3 to R5 X | No | 10 | 10 | 10 | 10 |

**Solar Radiation Storms - (High Energy Protons):**

| Radiation Storms Probability (Exceedance) | Level ($cm^{-2}$ $sr^{-1}$ $s^{-1}$) | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Active | ≥ S1 | No | 10 | 10 | 10 | 10 |
| Very Active | ≥ S3 * | No | 1 | 1 | 1 | 1 |

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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